

## TUBERCULOSIS AND THE SANITARIUM

READ TO MAUI WOMAN'S CLUB  
By DR. W. D. BALDWIN

In a sense it is perhaps fortunate that we do not and cannot realize the appalling loss of life due to tuberculosis, for if we did we would be in a continuous state of hysteria or depression.

When a cholera epidemic breaks out it naturally arouses dread and terror in a community; so also small pox and other epidemics. Why? Because of the suddenness of the attack—it is almost sudden death, which is so shocking to our sensibilities. A person is well one day, and a few days later is dead! The result is the health authorities, or the community itself, organizes (as it certainly should), and regulations are passed, action is taken, and the epidemic is stamped out. But in the case of tuberculosis the disease usually works slowly and insidiously, and therefore it is very difficult to realize its terrible ravages. One case of acute tuberculosis (called galloping consumption), which causes death within a very few weeks, will make more impression on a community than a hundred of the ordinary cases that drag out for perhaps five years. Such is human nature. I will not insist on statistics, but perhaps the prevalence of this disease can be pictured to the mind when I say that it has been estimated that in Great Britain the average number of deaths for each year of the war from direct war-causes, (bullets, so to speak) was only two and a quarter times the number of deaths from tuberculosis in the same country for the year 1916.

## Figures Deceptive

But statistics are often misleading. Several years ago the Palama Settlement began their splendid anti-tuberculosis campaign; and the public naturally expected to see immediate and startling results. After a year or two had gone by one of the trustees called my attention to the official board of health figures which showed that instead of a decrease in number of recorded deaths from tuberculosis per 1000 inhabitants there was actually an increase. He was troubled, and so was I, until I thought of an almost obvious explanation (which I still believe to be the true one), namely, that doctors, being human and not always infallible, sometimes, when signing a death certificate, will wonder for a moment what they should put down as the cause of death. Now if much is being said and written about tuberculosis, then naturally, in a case of doubt, that diagnosis suggests itself more more often than when there is no community interest in the subject. Also, with more general interest, and with district nurses ferreting out the cases, a great many more cases are bound to be correctly diagnosed as tuberculosis than formerly when they would have died in obscurity and been designated on the certificate as dying from "old age" or some other indefinite causation.

The board of health records for the territory show that during the past three years the death rate from tuberculosis has increased, especially during the year ending June 30, 1920 when it went to 2.0 per 1000 inhabitants as compared to an average during the previous eight years of nearly 1.75. On the other hand, the number of registered living cases for the year ending June 30, 1920 was 944 as compared to 1168 registered during the previous year. Dr. Trotter attributes the increased death rate as due to the prevalence of influenza.

## Conditions Induce Disease

The most ideal conditions for the high incidence of tuberculosis obtain where there is poverty coupled with crowded living quarters. In the big cities of Japan, tuberculosis has been greatly on the increase, the reason being that this nation has been changing too rapidly from a farming to a great manufacturing people. The factory hands are poorly housed and poorly paid. They therefore do not have adequate fresh air, are underfed and over-worked. An intelligent Japanese guide once likened Tokio to me to a great vortex into which the healthy country people entered, became swallowed up, and died. We may take such manufacturing cities as exist today in Japan as typical of the most suitable conditions that can exist for the spread of tuberculosis.

Now let us turn to the opposite picture, namely to the places and conditions of life that are safest from the standpoint of escaping the disease. One naturally thinks immediately of some isolated region with a glorious climate, like the crater of Haleakala. This is probably true if one was born there and stayed there, but, as I pointed out in another paper, those who are brought up in isolated regions are in great danger when they change to city life of contracting a deadly and rapidly fatal form of tuberculosis, for the reason that during childhood they have not received the usual small inoculations of the disease; they have not, as it were been vaccinated against the disease. The great majority of people live in villages, towns, and cities, and a very large percentage of such people receive this childhood inoculation which produces a partial immunity—only partial but very important. Now taking this normal life under civilized conditions, what particular place would you select as being the safest place to live in if you wished above all things to avoid tuberculosis? I think that not in a hundred guesses would you think of the place is in my own mind. The answer is, a well-conducted Tuberculosis Sanatorium. The great Dr. Osler used frequently to make this claim to his students, and recently Dr. Markus Paterson, one of the ablest of the Eng-

lish authorities, speaking from many years of personal experience as Superintendent of the Brompton Hospital Sanatorium of Fimley, makes the same assertion. (These men refer, of course, particularly to the nurses, doctors and non-tuberculous help in sanatoria.) When making the above astonishing claim, personally I would exclude infants as they have no acquired immunity; to be exact, I would exclude children up to the age of five. I think that statistics will bear out this statement. In explaining the reason for this strange fact, one authority would lay particular stress on the point that in a well-conducted sanatorium the infective agent (the tuberculosis bacillus) is destroyed; that is to say, each patient has a sputum cup and is allowed to expectorate only in the cup, and the contents is not allowed to dry and disseminate—as is the case usually with home patients—but is thoroughly disinfected. Another authority would explain it principally by the fact that in such an institution there is plenty of fresh air, good nourishing food, etc.

In other words, the same factors that obtain for the purpose of curing the patients also act as preventives for those who are not patients. Personally, although I believe that scrupulous care should be observed in the disposal of the sputum and in general cleanliness and that this is very important, yet I think that the chief explanation for the comparative safety of good sanatoria can be found in the general conditions of health in such institutions—that is, fresh air, good food, a generally health life with sufficient exercise but without exhausting labor. If we could all have the living conditions that the attendants of well-conducted sanatoria enjoy the drop in the incidence of tuberculosis would be enormous. In this consideration, climate is not one of the principle things; in fact, contrary to popular opinion, it is the least important of all. Both in the cure in sanatoria, and the prevention of the disease, climate cuts a very small figure. Here in the Islands, however, probably a climate, such as that of Kula, does have considerable influence both in the cure and the prevention of the disease. At near sea-level our climate is generally more or less enervating; it is not that it is too hot, but too even—little different in temperature between summer and winter, and much more important, little difference between the day and night temperature; whereas in Kula and all our higher altitudes there is a marked difference between the temperature of day and night. This is stimulating and healthful and is the main feature in climate that is recognized as being beneficial for the tuberculous patient; certainly those who live at our higher altitudes are generally rosier and healthier than those who live near sea level, which should mean that they are not as prone to succumb to the disease. As regards humidity, the popular belief that a dry climate is beneficial probably has no foundation in fact. A patient in a good sanatorium in dry Colorado has no better chance than a patient in an equally good sanatorium, in moist England.

## Types of Bacilli

The causative agent of the disease is, as you all know, the bacillus tuberculosis. In human tuberculosis there are two varieties of this bacillus: the human type, found in tuberculosis sputum; and the bovine type, which commonly affects cattle, and which is found in milk (and its products, such as butter and cheese) from tuberculous cows. But while this bovine form plays a minor role as regards pulmonary tuberculosis yet many regard it as the prime factor in immunizing the human race against the more deadly human form of bacillus. In other words, during childhood we drink milk or eat butter that is infected with this germ; from the alimentary canal these germs make their way to the glands of the chest or elsewhere; they become lodged

there, multiply, and develop tuberculous tissue; as a rule these tuberculous glands cause no symptoms whatever and instead produce a beneficial reaction, giving us a partial immunity against the more virulent human type of bacillus that commonly attacks the lungs. A few even go so far therefore as to argue that tuberculous milk is really a blessing in disguise to the human race. Perhaps it would be a blessing if we could regulate the dose so that we would never have more than a very minute dose, but as this is impossible I think it far safer to continue the excellent work inaugurated by the late Dr. Norgaard in the Islands in the line of eradicating tuberculous cows from our dairies. This natural method of vaccinating by way of drinking infected milk is too dangerous; but it suggests that possibly some day an immunity may be artificially produced by the injection of very weak strains of tubercle bacilli.

## Destroying the Germs

Tuberculosis of the lungs is nearly always caused by the human type of bacillus; this bacillus is sometimes found in fecal excreta, but, practically speaking, we may think of it as being only in sputum from tuberculous patients. The subject of sputum is an exceedingly disagreeable, almost nauseating, one to think about, but we must, face disagreeable things if we are to make headway against this disease. It is tragic that the infective material for the spread of this disease should be such a disgusting substance as sputum; the tragedy comes home to the patient when he observes that others are prone to avoid him—often he is cruelly ostracized—and tragic from the standpoint of public health because one of the most important measures to control this disease—many would say the most important measure—is the destruction of the sputum before it has had time to dry and become suspended in the atmosphere, and this cannot be done unless patients and ex-patients carry with them, wherever they go, sputum cups (made of paper and carried in the pocket); and these cups should be destroyed by fire or sterilized by boiling. The moist, fresh, sputum need not be feared, for bacteria do not arise from moist surfaces it is when it has dried that it is dangerous. The carrying out of this measure sounds easy, but, in practice, is extremely difficult. Many patients are ignorant and careless, and even after the training they get in a sanatorium, go forth and expectorate wherever they please; but the main difficulty comes from the public itself. A patient leaves a sanatorium with the right spirit; wherever he goes he carries his cup. What is the result? He has advertised the fact that he has tuberculosis, and although by the use of the cup he is practically of no menace whatever to the community, yet the public, whom he is trying to protect, immediately avoids him; he is ostracized. The patient, being human, cannot stand this ostracism, and so he resorts to methods of concealment such as expectorating into a handkerchief—a nasty and dangerous procedure. Never be afraid to associate with a patient or ex-patient who properly disposes of his sputum (if he has any). It is perfectly safe to live in the same house with such a person, with the exception that young children, say under five years of age, should be disbarred. This is where the Maui public can help or hinder this work; welcome the patient who carries his cup; ostracize the patient who does not

carry a cup, and tell him the reason why.

I have been speaking thus far of only one side of the subject, namely the infective cause, the tubercle bacillus. We cannot possibly eliminate entirely this bacillus—under civilized conditions it is everywhere—but we can partly eliminate it; we can reduce the dose—a very small dose will tend to immunize; a big dose to overwhelm—therefore this side of the

## Resistive Powers

problem has great importance. But the other side of this subject, relating to the causation of the disease, is to my mind of far greater importance—namely, our bodily resistance to the disease.

In the case of common "colds," and in pneumonia, often carry about with us, in our mouths and nasal passages, for months or years, the germs that cause these diseases, but do not "catch" the disease until something reduces our bodily resistance against it. If we become tired and chilled our resistance is lowered and the germs that we already have in our mouths get busy in our tissues and the result is a "cold" or pneumonia. (Some think that the presence of these germs is ordinarily beneficial by giving us a certain degree of immunity.) It is just so in case of tuberculosis; the majority of us carry the tubercle bacillus in an inactive state in the lymphatic glands; we get this infection in childhood, (and later on there may be from time to time re-infections.) We are rendered thereby partially immune; but if our resistance is lowered the germs may become active—because there is nothing in the blood to resist them—and then, migrating through the vascular system attack the lungs. (Another view is that when the lungs are involved the germs that actually cause the infection.)

(Continued on Page Six.)

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